

METHOD AND APPARATUS FOR IN-STORE MEDIA ADVERTISING

CROSS-REFERENCE TO RELATED APPLICATION

This application claims the benefit of U.S. Provisional Application No. 60/258,779 filed on December 28, 2000, and U.S. Provisional Patent Application 60/280,957 filed April 2, 2001 which are hereby incorporated by reference as if set forth in full herein.

BACKGROUND OF THE INVENTION

This invention relates generally to the field of advertising systems and more particularly tracking of presentation of advertising content to an audience within a known physical location.

Advertisers typically design advertising content for presentation to an audience of a desired demographic profile. Most advertisers seek out the most suitable broadcast medium for their advertising content based on matching the desired demographic profile to a broadcaster's claims about the size and demographic profile of the broadcaster's typical audience. Broadcasters in turn attempt to attract the largest possible audience and expend considerable effort in determining the size and demographic profile of a resultant audience. For example, television broadcasters seek out programming content appealing to a particular audience fitting a particular demographic profile. Once a television broadcaster selects programming content for broadcast, the television broadcaster expends additional effort to determine the size and actual demographic profile of the viewing audience reached by the programming content. The larger the size of an audience fitting a desired demographic profile, the more a broadcaster can charge an advertiser for carrying the advertiser's advertising content.

However, broadcasters often fall short of selecting proper programming content for a particular audience demographic.

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Sometimes the programming content fails to attract a large audience. At other times, the audience attracted to a particular program does not fit the broadcaster's expected demographic profile. In these cases, an advertiser may not be willing to pay a premium for the broadcaster's services if the advertiser believes the broadcaster does not attract a large audience fitting a desired demographic profile.

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Furthermore, many broadcast mediums reach an audience of uncertain size. For example, television commercials are broadcast over a television channel for reception by a television receiver. Whether or not a television receiver has an audience when the television receiver is receiving the broadcast is difficult to determine. In this case, a broadcaster must resort to indirect sampling means and use statistically based extrapolations to estimate the size of an audience for a particular broadcast. While often accurate, the indirect sampling means and extrapolations are expensive procedures that require time consuming data collection and analysis steps.

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The problems of collecting and analyzing audience size and demographics are become even more difficult in the cases of a new medium. Television and radio broadcasters can rely on independently run and well established organizations to collect data on audience size and demographic profiles. However, new mediums, such as in-store advertising, do not have well established measurement systems in place for advertisers and broadcasters to determine a broadcaster's ability to reach a particular audience.

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Therefore a need exists to establish the demographic profile and size of a broadcaster's audience. The present invention meets such need.

SUMMARY OF THE INVENTION

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In one aspect of the invention, a method and apparatus is provided for networked in-store media advertising. A local media

1 advertising system is operably coupled to a media content server
via a communications network such as the Internet. The local
media advertising system receives advertising content and an
5 advertising content display schedule from the content server.
The local media advertising system displays the advertising
content according to the advertising content display schedule.
The local media advertising system has a viewer sensor that the
local media advertising system uses to compile viewer data about
10 the number of viewers and customers in the vicinity of the
displayed media content. The local media advertising system
generates viewer information about how many viewers and customers
were in the vicinity of the displayed advertising content using
the viewer data and the advertising content display schedule.
15 The local media advertising system then transmits the viewer
information to a statistics server via the communications
network. Advertisers can then retrieve the viewer information
from the statistics server in order to monitor the effectiveness
of an advertising campaign.

20 In another aspect of the invention, advertising content and
viewer information are received and transmitted by an advertising
system operably coupled to a content server and a statistics
server via a communications network. The advertising system
receives from the content server via the communications network
25 advertising content and an advertising content display schedule.
The advertising system displays the advertising content according
to the advertising content display schedule while receiving
viewer signals indicating the number of viewers available to view
the advertising content. The advertising system generates viewer
30 information using the viewer signals and the advertising content
display schedule and transmits the viewer information to the
statistics server via the communications network.

35 In another aspect of the invention, the advertising system
receives sales data while displaying the advertising content and

1 generates sales information using the sales data and the advertising content display schedule.

5 In another aspect of the invention, an advertising system includes means for receiving advertising content and an advertising content display schedule from a content server, means for displaying the advertising content according to the advertising content display schedule, means for receiving viewer signals while displaying the advertising content, means for generating viewer information using the viewer signals and the advertising content display schedule, and means for transmitting the viewer information to a statistics server.

10 In another aspect of the invention, a networked media advertising system includes a content server and a statistics server operably coupled via a communications network such as the Internet to an advertising system. The advertising system includes an advertising controller, an advertising display device operably coupled to the advertising controller, and a viewer sensor operably coupled to the advertising controller.

20 BRIEF DESCRIPTION OF THE DRAWINGS

The features, aspects, and advantages of the present invention will become better understood with regard to the following detailed description, accompanying drawings, and appendix where:

25 FIG. 1 is a network diagram depicting an embodiment of an in-store media advertising system in accordance with the present invention;

30 FIG. 2 is a network diagram depicting a single in-store system in accordance with the present invention;

FIG. 3 is a hardware architecture diagram for a STB as described in FIG. 2;

35 FIG. 4 is a hardware architecture diagram for a general purpose computer suitable for use as a host of an in-store media advertising server as described in FIG. 2;

FIG. 5 is collaboration diagram depicting the data flow within an in-store media advertising system in accordance with the present invention;

FIG. 6 is a sequence diagram depicting an exemplary communication and operation sequence of the objects of FIG. 5;

FIG. 7 is a sequence diagram depicting the retrieval of advertising statistics from a statistics server by an advertiser;

FIG. 8 is a process flow diagram of calculating advertising statistics by a statistics server; and

FIG. 9 is a block diagram depicting a customer sensor in accordance with the present invention.

DETAILED DESCRIPTION

FIG. 1 is a network diagram depicting an embodiment of a networked media advertising system in accordance with the present invention. A networked media advertising system includes at least one local advertising system including such as in-store system 100, at least one content server 102, and at least one statistical server 104 operably coupled via a communications network such as the Internet 105. In operation, a broadcaster 106 provides advertising content to the in-store system using the content server. The in-store system displays the advertising content to a customer 108. The in-store system monitors the customer and transmits data about the customer to the statistics server.

In slightly more detail, the content server provides a user interface for submission by the broadcaster of advertising content. The broadcaster submits advertising content as well as scheduling information to the content server. The content server formats the advertising content for use by the in-store system. The content server then transmits to the in-store system the advertising content and the scheduling information. The in-store system uses the scheduling information to determine when to display the advertising content to the customer. The in-store

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system collects information about the number of customers and
advertising content viewers that the in-store system detects.
The in-store system transmits the information about the customers
5 and advertising content viewers to the statistics server. The
statistics server uses the customer and advertising content
viewer information as well as scheduling information to generate
statistics about how many viewers saw the advertising content.

10 FIG. 2 is a network diagram depicting a single in-store
system in accordance with the present invention. An in-store
system includes an advertising controller such as a Set Top Box
(STB) 110 operably coupled to at least one advertising display
device such as a video display 112 and to at least one viewer
sensor such as a viewer sensor 114. The STB communicates with
15 an in-store media advertising server 122 via a store
communications link 121. The in-store media advertising server
includes the previously described content server 102 and a
statistics server 104 of FIG. 1. A broadcaster uses the content
server portion of the in-store media advertising server to hold
20 advertising content provided by a content provider 126. The
content provider uses a browser 124 to access the statistics
server portion of the in-store media advertising server.

25 In operation, the content server portion of the in-store
media advertising server receives advertising content from the
content provider. The STB requests and receives advertising
content from the in-store media advertising server and displays
the advertising content to a viewer 120 using the video display.
The STB detects how many viewers are in front of the video
display using viewer sensor 114. The STB transmits advertising
30 content display information to the statistical server portion of
the in-store media advertising server. The advertising content
display information includes information about which portion of
the advertising content is being displayed and how many viewers
are standing in front of the video display. The content provider
35 accesses the advertising content display information stored by

the statistical server portion of the in-store media advertising server to determine how many viewers may have viewed the advertising content displayed by the in-store system.

In one embodiment of the invention in accordance with the present invention, the store communications link has a communications network including a computer network such as the Internet. In this embodiment, the STB and the in-store media advertising server communicate with each other using communications protocols including the suite of Internet protocols built upon the Transmission Control Protocol/Internet Protocol (TCP/IP) such as Hyper Text Transfer Protocol (HTTP) for hypertext document transfer. Alternatively, the STB communicates over a proprietary communications network including satellite transmissions.

In an embodiment of the invention in accordance with the present invention, the STB is operably coupled to at least one customer sensor 116. The STB monitors the entry and exit of customers 108 into a store using the customer sensor. Using information collected from a customer sensor, the STB can determine the number of customers in a store at any given moment. This customer information is transmitted to the in-store media advertising server along with the previously described advertising content information.

In another embodiment of the invention in accordance with the present invention, the STB is operably coupled to at least one store sales data collection system such as Point of Sale (POS) terminal 118. The STB collects sales information from the POS terminal about sales made to buyers 119. The sales information is transmitted to the in-store media advertising server along with the previously described advertising content information.

FIG. 9 is a block diagram depicting exemplary an viewer or customer sensor in accordance with the present invention. A viewer or customer sensor such as viewer sensor 1900 is operably

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coupled to a counting unit 1902. The counting unit is operably
coupled to a STB 1904. In operation the viewer sensor generates
viewer detection signals in response to viewers 1906 within the
5 detection range of the viewer sensor. The viewer sensor
transmits the viewer detection signals to the counting unit. The
counting unit receives the viewer detection signals and generates
a viewer signal using the viewer detection signals. The counting
unit then transmits the viewer signal to the STB.

10 In one embodiment of a counting unit in accordance with the
present invention, the counting unit generates a viewer signal
by summing up the number of viewer detection signals received by
the counting unit over a period of time.

15 In one embodiment of a viewer sensor, the viewer sensor
detects viewers without discriminating between incoming and
outgoing viewers. In this embodiment, the counting unit receives
the viewer detection signals and divides by two to determine the
total number of viewers in a location.

20 In another embodiment of a viewer sensor, the viewer sensor
discriminates between incoming and outgoing viewers. In this
embodiment, the viewer detection signal includes a directional
component indicating the direction of movement of the viewer.
The counting unit in this embodiment generates viewer signals
including a directional component.

25 A suitable viewer sensor is a model number IRM01 ceiling
mounted active infrared matrix sensor and a suitable counting
unit is a model number RTC801 counting unit both manufactured by
Prodco Technology of Toronto, Canada.

30 FIG. 3 is a hardware architecture diagram of an exemplary
STB in accordance with the present invention. A STB includes a
microprocessor 1200, comprised of a Central Processing Unit (CPU)
1210, a memory cache 1220, and a bus interface 1230. The bus
interface is operatively coupled via a system bus 1235 to a main
memory 1240 and an Input/Output (I/O) interface control unit
35 1245. The I/O interface control unit is operatively coupled via

I/O local bus 1250 to a storage controller 1295, a video controller 1290, a network controller 1280, and I/O expansion slots 1275.

A communications device 1296 operably coupled to the network controller is adapted to allow software objects hosted by the STB to communicate via a network with remotely hosted software objects.

The storage controller is operatively coupled to a storage device 1225 for permanent storage of processor instructions 1297 and data 1298. The data includes advertising content for output by the STB and the previously described advertising content information.

The video controller is operatively coupled to a video monitor 1260. The STB uses the video controller to send advertising content to the video monitor for display. Exemplary video monitors suitable for use by the STB are depicted in Appendix B which is incorporated by reference as if fully stated herein.

A sensor interface 1285 is operably coupled to an I/O expansion slot. The STB uses the sensor interface to couple with the previously described viewer and customer sensors.

Processor instructions 1297 implementing the software functions of a STB are stored on the disk storage device until the microprocessor retrieves the processor instructions and stores them in the main memory. The microprocessor then executes the processor instructions stored in the main memory to implement the functions of a STB.

FIG. 4 is a hardware architecture diagram for a general purpose computer suitable for use as a host of an in-store media advertising server as described in FIG. 2. A general purpose computer includes a microprocessor 1100, comprised of a Central Processing Unit (CPU) 1110, a memory cache 1120, and a bus interface 1130. The bus interface is operatively coupled via a system bus 1135 to a main memory 1140 and an Input/Output (I/O)

1 interface control unit 1145. The I/O interface control unit is
operatively coupled via I/O local bus 1150 to a storage
controller 1195, a video controller 1190, a network controller
5 1180, and I/O expansion slots 1175.

A communications device 1196 operably coupled to the network
controller is adapted to allow software objects hosted by the
general purpose computer to communicate via a network with
remotely hosted software objects.

10 The storage controller is operatively coupled to a storage
device 1125 for permanent storage of processor instructions 1197
and data 1198. The data includes advertising content for use by
a STB and the previously described advertising content
information.

15 The video controller is operatively coupled to a video
monitor 1160. The general purpose computer uses the video
monitor to display information to a user.

20 The keyboard controller is operably coupled to a keyboard
1165. The general purpose computer receives user inputs via the
keyboard.

25 Processor instructions 1197 implementing the software
functions of the previously described content server and
statistical server are stored on the disk storage device until
the microprocessor retrieves the processor instructions and
stores them in the main memory. The microprocessor then executes
the processor instructions stored in the main memory to implement
the functions of a content server or a statistical server.

30 FIG. 5 is collaboration diagram depicting the data flow
within an exemplary embodiment of an in-store media advertising
system in accordance with the present invention. A previously
described in-store system 100 is operably coupled to a previously
described remotely hosted in-store media advertising server 122.

35 The in-store system includes a STB 110 that receives
advertising content and an advertising content playback schedule
1500 from a content server portion 102 of the in-store media

1 advertising server. The STB stores the advertising content in
a read and write local storage device such as a hard disk. The
STB uses the advertising content playback schedule to determine
5 when the advertising content 1504 should be sent to a video
display 112.

10 A viewer sensor 114 transmits a viewer count signal 1506 to
the STB. The viewer count signal corresponds to the number of
viewers in the vicinity of the video display at any given instant
in time. The STB records the number of viewers in the vicinity
of the video display at specific time intervals.

15 The STB combines viewer sensor information with advertising
content scheduling information to create advertising content
display information. The advertising content display information
includes information about which portion of the advertising
content is being displayed and how many viewers are standing in
front of the video display at a specific time. The advertising
content display information is sent to a statistics server 104
for further processing.

20 In an another embodiment of an in-store system in accordance
with the present invention, the STB combines information from a
point of sale terminal 118 with the advertising content display
information before the advertising content display information
is sent to the statistics server.

25 In an another embodiment of an in-store system in accordance
with the present invention, the STB combines information taken
from customer sensor 116 and combines it with the advertising
content display information. The customer sensor produces a
signal 1510 proportional to the number of customers within a
30 store served by the in-store system.

35 FIG. 6 is a sequence diagram depicting an exemplary
communication and operation sequence of the exemplary objects of
FIG. 5. An STB 110 transmits an advertising and scheduling
request 1602 to a content server 102. The content server
transmits advertising content and scheduling information 1604 to

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the STB. The STB uses the scheduling information to determine when portions of the advertising content should be played on an advertising content output system such a video display.

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The STB displays 1606 advertising content according to the scheduling information. During the display process, the STB collects customer and viewer data 1608 from customer and viewer sensors 1600. The viewer data contains information about how many viewers are within the vicinity of a video display used by the STB to display the advertising content. The customer sensors sense the number of customers entering and leaving a store served by the STB.

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The STB collects sales data 1610 from a point of sale device 118 during the time the STB is displaying advertising content. The sales data includes the number of transactions completed, the value of the transactions, and an indication of the actual products sold during the transaction such as a product's Universal Product Code (UPC).

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The STB continues to collect 1611 customer, viewer, and sales data while the STB is displaying advertising content. The STB formats 1612 the collected data and transmits the collected data 1614 to a statistics server for use by a content provider.

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In one embodiment of an in-store system in accordance with the present invention, a customer sensor is placed at the entrance to the store. The customer sensor senses when a customer enters or leaves the store using the entrance. In this case, a customer is registered by the sensor twice, once when the customer enters the store, and once when the customer leaves the store. In this case, the total number of customers visiting the store during a day can be estimated by dividing the number of times the customer sensor sensed a customer and dividing that number by two.

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In another embodiment an in-store system in accordance with the present invention, the customer sensor is configured to sense the direction that a customer is moving when the customer is

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sensed. For example, the customer sensor is placed at an entrance to a store and if a customer walks into the store using the entrance, the sensor transmits an entrance signal to the STB indicating that a customer came into the store. If a customer walks out of the store using the entrance, the customer sensor transmits an exit signal to the STB indicating that a customer has left the store. The STB determines the number of customers in the store at any given time by subtracting the number of exit signals the STB received from the number of entrance signals the STB received.

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In another embodiment of a viewer sensor included in an in-store system in accordance with the present invention, a video camera is used to capture images of viewers in the vicinity of a video display device displaying advertising content. The images are analyzed by the STB to determine the demographic distribution of the viewers such as the ratio of males to females viewing the advertising content. Alternatively, the images are sent to the statistics server as part of the viewer data so that the images can be analyzed to reveal viewer demographics by the broadcaster and the content provider.

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In another embodiment of an in-store system in accordance with the present invention, the advertising content and scheduling data is not loaded into the STB as a single unit, instead the STB receives the advertising content from streaming sources such as a streaming server. In this embodiment, the STB receives scheduling information from a content server. The STB uses the scheduling information to request streaming content from the streaming server.

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In another embodiment of an in-store system in accordance with the present invention, the STB combines advertising content received from different content servers to create content for display on a video device. For example, the STB receives video based advertising content encoded in a digital format such as MPEG4 such as a television commercial from one content server and

1 receives digital advertising content such as an Internet banner advertisement from another advertising content server. The STB combines the two contents to create a single advertising content
5 provided to a video display. Alternatively, the STB combines in-store information such as an in-store promotion with the advertising content.

10 In another embodiment of an in-store system in accordance with the present invention, the advertising content display is accomplished through a video display system including viewer input capabilities. For example, the video display system is housed in a kiosk that a viewer can reach. In this way, interactive advertising content can be displayed by the STB and the STB can record viewer interactions with the interactive
15 advertising content for transmission to the statistics server.

FIG. 7 is a sequence diagram depicting an exemplary retrieval process of advertising statistics from an exemplary statistics server by an advertiser in accordance with the present invention. An advertiser uses an advertising client 1700 to send a statistics request 1704 to a statistics server 104. The statistics request includes an advertiser identifier used by the statistics server to find customer and viewer data from stores to which the advertiser's content was sent. The statistics server finds the customer and viewer data from each relevant
20 store and calculates advertising statistics useful in evaluating the effectiveness of an advertising campaign. The statistics server formats the data into a format suitable for transmission to the advertising client and transmits the formatted statistics 1708 to the advertising client for display to the advertiser.

25 FIG. 8 is a process flow diagram of an exemplary process for calculating advertising statistics by an exemplary statistics server in accordance with the present invention. To calculate statistics for an advertiser, the statistics server gets 1800 the real time customer and viewer data 1802 for the relevant stores.
30 The previously described customer and viewer data comprises real-
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time data collected from in-store systems. The statistics server gets 1804 the static data associated with a relevant store. The static data includes the fees paid by the advertiser to have advertising content sent to the relevant store. The content server performs calculations 1808 to produce statistical measures of the effectiveness of the advertising placement. The statistics server formats 1810 the statistics into a statistics document 1812 suitable for transmission to a previously described advertiser client. The statistics server transmits 1814 the statistics document to the advertising client and terminates 1816 the process.

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Although this invention has been described in certain specific embodiments, many additional modifications and variations would be apparent to those skilled in the art. It is therefore to be understood that this invention may be practiced otherwise than as specifically described. Thus, the present embodiments of the invention should be considered in all respects as illustrative and not restrictive, the scope of the invention to be determined by any claims supportable by this application and the claims' equivalents rather than the foregoing description.

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